NAVAL MEDICAL RESEARCH AND DEVELOPMENT
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NMRC: Global Health Engagement

SILVER SPRING, Md. - For decades Navy Medicine's OCONUS laboratories have been actively involved in global health engagement supporting the United States European, Central, African, Pacific and Southern Commands.

The OCONUS labs are the U.S. Naval Medical Research Unit No. 3 (NAMRU-3) in Cairo with a major field site in Accra, Ghana; the U.S. Naval Medical Research Unit No. 6 (NAMRU-6) in Lima with a field laboratory in the Amazon Basin city of Iquitos, Peru; and the U.S. Naval Medical Research Center – Asia (NMRC-Asia) located in Singapore with a field site in Phnom Penh, Cambodia.

"Each of our overseas labs has a unique history and is a forward deployed extension of Navy Medicine's infectious disease research and public health preparedness network," said Capt. John Sanders, NMRC commanding officer. "They play a key role in our national defense by addressing emerging and re-emerging infectious diseases threats; evaluating new drugs, vaccines, and diagnostics; and responding to COCOM concerns, all through positive health engagements with our partner nations. The NAMRUs fill a very important niche for the United States because they develop strong and productive relationships with their host countries and focus on those diseases of common interest."

NAMRU-3 in Cairo has promoted global health research since 1946 and has been in continuous operation even during the breaks in diplomatic relations and on through the current era of political

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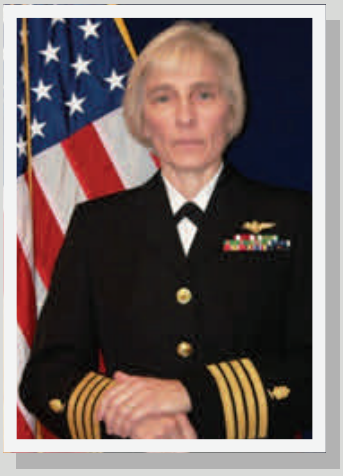
Mrs. Reham Tageldin (center) from U.S. Naval Medical Research Unit No. 3's Vector Biology Research Program conducted mosquito identification training for Nigerian laboratory personnel at the Calabar Institute of Tropical Diseases Research and Prevention in the Cross River State of Nigeria. NAMRU-3, in Cairo, Egypt, is DoD's largest overseas laboratory.

NMRC Commanding Officer's Message

"Global Health" has become a very popular term in the last few years as evidenced by the remarkable number of Global Health programs that have been established at universities throughout the U.S. and around the world, many of which utilize different definitions for what is meant by "Global Health." However, a common theme among them all is the idea that there are health issues that cross borders or transcend national planning and require a global view and international cooperation to manage. As Navy Medicine recognizes Global Health Engagement during December, I am pleased and proud to highlight that the Navy Medicine R&D Enterprise has been a leader in the development of this thinking. We have many examples of our activities in Global Health Engagement, ranging from NHRC's incredible leadership in the DoD HIV/AIDS Prevention Program (DHAPP) with reach to militaries around the world to the groundbreaking development of vaccines at NMRC against malaria, dengue, and diarrheal diseases, but of course, we most often think of Navy Medicine's OCONUS laboratories. The three OCONUS labs are the U.S. Naval Medical Research Unit No. 3 in Cairo with a detachment in Accra, Ghana; the U.S. Naval Medical Research Unit No. 6 in Lima with a field laboratory in the Amazon Basin city of Iquitos, Peru; and the U.S. Naval Medical Research Center-Asia (NMRC-Asia)/Naval Medical Research Unit No. 2 now located in Singapore with a field site in Phnom Penh, Cambodia. Each lab is a forward deployed extension of Navy Medicine's infectious disease research and public health preparedness network. They play a key role in our national defense by addressing emerging and re-emerging infectious disease threats; evaluating new drugs, vaccines, and diagnostics; and responding to COCOM concerns, all through positive health engagements with our partner nations. They are justifiably viewed as Critical National Assets.

NMRC Commanding Officer sends
John. W. Sanders III, CAPT, MC, USN

NAMRU-San Antonio Commanding Officer's Message



Strategic planning is an organization's process of defining its strategy, or direction, and making decisions on allocating its resources to pursue the strategy. Strategic planning focuses on an organization's mission and identifies internal and external customers. It also details what needs to be done for the organization to excel. Over the past year, Naval Medical Research Unit San Antonio's professional staff has worked diligently in creating a strategic plan to deliver cutting-edge medical, craniofacial, and directed energy bio-medical research in support of our warfighters in-garrison and on the battlefield. In terms of what we need to do to excel, Vice Admiral Nathan has made it very clear. In his recent *Navy Medicine Strategy 2014* statement, he said, "Last year we charted a clear course on Readiness, Value, and Jointness; one that has served us well as we face challenges related to sequestration, government shutdown, and the standup of the Defense Health Agency (DHA). In September, Navy Medicine senior leaders met to assess our performance over the last year and set forth our expectations as we enter 2014. Our priorities remain the same: Readiness, Value, and Jointness. These priorities serve as our foundation and guide our every initiative. The bottom line is we must continue to maintain the highest state of medical readiness for our Naval forces, while bringing more value and jointness to our operations." For Naval Medical Research Unit San Antonio this means we will continue to refine our strategic plan to judiciously allocate resources in conducting relevant research that aligns with the Navy and Marine Corps' readiness mission, yields the greatest value for the associated costs, and leverages productive joint opportunities in addressing critical warfighter capability gaps. As our country faces austere times of diminishing resources, we stand ready for the challenge and are resolved to help facilitate our country's strategic advantages over those who oppose our national interests.

NAMRU-San Antonio Commanding Officer sends
Rita G. Simmons, CAPT, MSC, USN

Ambassador David M. Satterfield Visits NAMRU-3

From NAMRU-3 public affairs

CAIRO - Ambassador David M. Satterfield, the Chargé d'Affaires of the U.S. Embassy in Cairo, paid a visit to the U.S. Naval Medical Research Unit No. 3 (NAMRU-3), October 21. Ambassador Satterfield arrived in Cairo in August 2013, and is on leave of absence from his position as Director General of the Multinational Force and Observers (MFO) in the Sinai Peninsula, a post he assumed in July 2009.

NAMRU-3 has a long history of assistance to the MFO. Ambassador Satterfield was knowledgeable of NAMRU-3's research and training at the MFO on leishmaniasis and sand flies, which are the transmitters of this dangerous disease. From previous assignments in the region, he remembered NAMRU-3's work on the parasitology of schistosomiasis.

Aware of Ambassador Satterfield's special interest in vector biology research at the MFO, NAMRU-3's Vector Biology Research Program (VBRP) team explained the ongoing research projects that impact the health of the troops in the Sinai and he toured the spaces where they conduct their studies. Acting Program Head, Dr. Alia explained the history of sand fly surveillance and control at the MFO camps from the 1980s to the present, and identified the sites and sand fly habitats in the Leishmaniasis endemic area in the North Sinai. The ambassador also saw how sand flies are reared and maintained in VBRP insectariums.

L to R: NAMRU-3's Noha Watany; Ambassador David M. Satterfield; Lt. Cmdr. Levin; U.S. Embassy's Seth Wickas; Capt. Buhari Oyofo, NAMRU-3 commanding officer. The Ambassador uses microscope to look at sand fly eggs and larvae inside the sand fly insectary in the NAMRU-3 Vector Biology Research Program lab.

The next stop on the tour was the Viral and Zoonotic Diseases Research Program where the ambassador was informed of the outbreak response capabilities of NAMRU-3. He was particularly interested in NAMRU-3's response during the Middle East Respiratory Syndrome Coronavirus (MERS-CoV) outbreak and the team's annual activities in influenza virus surveillance.

While visiting the parasitology laboratory in the Bacterial and Parasitic Disease Research Program, Ambassador Satterfield, who was a premed student in college, had the opportunity to view slides of blood, stool and urine parasites. Following the tour, Ambassador Satterfield addressed the staff. He expressed his appreciation for the work NAMRU-3 has done in the region and in particular its assistance to the MFO. He ended his comments with the hope that the evacuated U.S. staff would be able to return soon.

NAMRU-SA Patient Active Warming Systems

SAN ANTONIO—Hemorrhage is currently the most common cause of death on the battlefield. One of the ways researchers are trying to mitigate this problem is through Patient Active Warming Systems (PAWS). These devices, used in tactical field care, particularly during en route transport, are designed to prevent mild to moderate hypothermia in battlefield trauma patients.

Scientists are determining if hypothermia, known to exacerbate bleeding, can be prevented through the use of one of these warming systems.

Researchers at the Naval Medical Research Unit – San Antonio (NAMRU-SA) recent-

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Green man phantoms (left) used for simulating hypothermic body biological load for performance testing of PAWS devices at NAMRU-San Antonio.

NAMRU-3 Detachment in Ghana Has New OIC

From NAMRU-3 public affairs

CAIRO - Realizing the importance of establishing a good working relationship with the research partners within the United States Africa Command, Capt. Buhari Oyofo, commanding officer of the U.S. Naval Medical Research Unit No. 3 (NAMRU-3) travelled to Ghana to introduce Lt. Nehkonti Adams, the new Officer –in-Charge of the NAMRU-3 Detachment, to the principal collaborators and to visit the sites where the detachment conducts research. They also visited the U.S. Embassy in Accra.

Oyofo said, "This was an important trip with the goal to meet with the new leaders, both U.S. and local, to ask for continued support for NAMRU-3 research initiatives in the region, especially those involving AFRICOM mil-to-mil collaboration. Introducing the new OIC to the leaders ensures continuity and shows that this is a team effort to accomplish our mission."

"The Commanding Officer's visit was key in my transition to OIC of the Ghana Detachment. We were able to visit key research collaborators to discuss ongoing projects as well as future endeavors. As Ghana DET OIC, I am in a unique position to be able to work with the Ghana Armed Forces, Ghana Health Service, and Noguchi Memorial Institute of Medical Research collectively to produce great research which will benefit the people of Ghana," said Adams.

Oyofo and Adams met with Col. Seidu, the commanding officer of the 66th Artillery Division in the Ho region where NAMRU-3 is working on an avian influenza research project focusing on troop education.

They met with Col. George Sam, the commanding officer of the 2nd Infantry Division in Takoradi and then checked on the lab's ongoing activities and capacity building efforts.

"This lab provides important support that makes a real difference for the military personnel and their families for the whole region," commented Col. Sam.

Capt. Buhari Oyofo (right), Commanding Officer of NAMRU-3 travelled to Ghana to introduce Lt. Nehkonti Adams (left), the new Officer in Charge of the NAMRU-3 Detachment, to the principal collaborators and to visit the sites where the detachment conducts research. Commodore Zowornu (center) Commander of the Fleet Navy Base in Sekondi. Photo by Ghanaian staff.

Meeting with Commodore Zowornu, who recently assumed command of the fleet navy base in Sekondi, provided an excellent opportunity for Oyofo and Adams to ask for his support for the Sexually Transmitted Infection (STI) studies with military families under his command.

The final military meeting was with the director of the Armed Forces Medical Services, Brig. Gen. Al Hassan. Also new on the job, Hassan affirmed umbrella support for the Ghana Armed Forces.

They met with Dr. Amankwa, the director of the Ghana Public Health Services. He is the NAMRU-3 Detachment's primary link with the Ghana Ministry of Health. His support enables NAMRU-3 to continue to work in collaboration with the Noguchi Memorial Medical Research Institute (NMMRI).

When Oyofo and Adams met with Prof. Koram, the director of the NMMRI, they thanked him for the ongoing support of NAMRU-3 activities and for providing the necessary work spaces. They also discussed the way forward to strengthen our partnerships.

At the end of the visit, Oyofo met with the staff at the detachment to thank them for their support, work, and dedication, and listened to their ideas for ways to improve the detachment.

NAMRU-3 Assists in International Health Regulations Assessments in Egypt

by Dr. Chris Zimmerman, Head, NAMRU-3 Global Disease and Detection Program

CAIRO – The U.S. Naval Medical Research Unit No. 3's (NAMRU-3) Global Disease Detection and Response Program (GDDRP) recently completed International Health Regulations (IHR) assessments at three units of the Central Public Health Laboratory of the Egyptian Ministry of Health and Population (MOHP). NAMRU-3 and CDC are working together in their roles as WHO Collaborating Centres to support Egypt's MOHP efforts to achieve compliance with IHR 2005. These efforts represent a close collaboration between GDDRP and the staff of the Egyptian MOHP's Epidemiology Surveillance Unit and the Central Public Health Laboratory (CPHL). These activities began with a series of baseline assessments in April 2012. WHO's laboratory assessment tools, which were designed for the purpose of assessing IHR 2005 compliance, where chosen for these assessments.

The results of each assessment were reviewed by GDDRP and MOHP partners and they provided a report containing findings and recommendations for compliance. The WHO laboratory assessment tools made it easy to generate reports with specific recommendations to improve laboratory capacity and are used in follow-up assessments to determine progress in an objective way. MOHP staff then share these reports with the leadership of the laboratory.

To assist in achieving compliance GDDRP staff provides follow-up support to the laboratories. This included follow up on the corrective actions recommended by the assessors, participation as faculty and facilitators in training for MOHP laboratory managers using the WHO tools, and support to the MOHP in the re-assessments of laboratories after the implementation of corrective actions.

These activities have strengthened the collaborative work between GDDRP and the Egyptian MOHP and are helping to move Egypt towards compliance with IHR 2005.

"I consider this plan of assessments, training and re-assessments very helpful to us to reach the requirements of IHR. The immediate implementation of this plan will significantly help us as we have a lot to do in a short period of time," said Dr. Ahmad Safwat who is the focal point for IHR implementation at CPHL.

To date ten Egyptian public health laboratories have been assessed. The laboratories were selected to cover different levels of the public health sector with four central public health laboratories, three regional laboratories and three governorate level laboratories.

In addition, laboratories were chosen to cover different parts of the country with public health laboratories in Cairo, Giza, Alexandria, Damanhour and Port Said. Additional assessments are planned to cover public health laboratories in central as well as Upper Egypt.

NAMRU-3 laboratory technicians at the Damahour serology laboratory during the International Health Regulations assessments to bring the laboratory into compliance with the International Health Regulations (IHR2005). Photo by Dr. Hoda Mansour.

Saliva a Diagnostic Measure of Innate Immune Biomarkers

From NAMRU-SA public affairs

Dr. Alexander Burdette (above) from, NAMRU-SA, preparing assay buffer solutions to use for the human cytokine bio-plex kit.

SAN ANTONIO, Texas - Military personnel are frequently exposed to a wide variety of viruses and bacteria due to overseas travel requirements, environmental exposure, and communal housing situations. Salivary diagnostics has become an emergent field allowing for the development of rapid, non-invasive identification of the presence of, or exposure to, chemical and biological agents or compounds. The ability to rapidly diagnose these infections would be instrumental in crafting the appropriate first line treatment, leading to improved prognosis and an overall reduction in antibiotic use.

Human saliva is a biological fluid with enormous diagnostic potential. Samples are easily obtained, compatible with the emerging field of microfluid immunoassays, biosensors, proteomics, transcriptomics, and "point-of-care" handheld devices. On-going studies at Naval Medical Research Unit San Antonio (NAMRU-SA) are geared toward evaluation and identification of biomarkers in saliva which can detect and rapidly differentiate between prior infections of respiratory bacteria and viruses. In a recent study, a total of 28 cytokines and chemokines (innate immune biomarkers) in saliva and blood samples obtained from 38 healthy subjects and 19 bacterial infected or viral infected individuals were evaluated. Among this panel a subset of six biomarkers were identified capable of differentiating viral or bacterial infections, as opposed to only three biomarkers identified in the blood samples.

These data are among the first reports of bacterial and virus-mediated immune biomarkers present in saliva, a readily available, non-invasive measure, which may aid in rapid diagnosis of respiratory infections. When combined with on-going advances in hand-held biosensors, currently being developed at NAMRU-SA, this platform will serve as a novel approach for both clinical and "in theatre" detection of microbial infections.

Navy Medicine Researcher Participates in Pacific Partnership

SILVER SPRING, Md. – During Pacific Partnership 2013, Lt. Cmdr. Bradley Hickey served as a Preventive Medicine Planner for the Kingdom of Tonga and the Republic of Kiribati. His primary duties included engaging with the local Ministries of Health and the environmental health infrastructure to increased public health capacity. He was a member of the advanced team in Tonga and Kirbati that planned events including direct health, veterinary and engineering engagements and public outreach events.

"The opportunity to be part of PP-13 has made me a better global citizen and a more informed Naval Officer. I returned from this mission with a renewed sense of passion for the fight against infectious diseases and I witnessed how important the research being conducted at the Naval Medical Research Center is for both our warfighters and our global neighbors," said Hickey.

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TARAWA, Kiribati (July 17, 2013) Lt. Cmdr. Bradley Hickey gives stuffed animals to a student at Tarawa's School for the Disabled children during a Pacific Partnership 2013 community service event where partner nation military and U.S. service members gave away toys donated by Project Handclasp. (U.S. Navy photo by Mass Communication Specialist 2nd Class Tim D. Godbee)

Capacity Building for Nigerian Laboratory

From NAMRU-3 public affairs

CAIRO- Supporting a U.S. Department of State project, researchers from the U.S. Naval Medical Research Unit No. 3's (NAMRU-3) Bacterial and Parasitic Disease Research and Vector Biology Research Programs visited the Calabar Institute of Tropical Diseases Research and Prevention (CITDR&P) in the Cross River State of Nigeria in a capacity building effort, September 1-6, 2013. The team was setting up new laboratory spaces and installing equipment as well as conducting refresher training on malaria detection, which included identifying *Plasmodium* species by microscopy, ELISA techniques, malaria vector identification, and molecular detection of malaria treatment failure by PCR.

After installing the new equipment, the NAMRU-3 staff trained three groups on the equipment and presented lectures. The groups focused on molecular, vector identification and ELISA, and malaria microscopy.

"Our collaborators at CITDR&P did everything they could to facilitate our mission and make use of the opportunity to have the NAMRU-3 staff there," said Dr. Hanan El Mohammady, who headed the Bacterial and Parasitic Disease laboratory team.

"There was no downtime on this visit. Each member of the team put in a full day. CITDR&P staff worked beyond their normal schedule, staying with the NAMRU-3 team to accomplish the installation and training," said Dr. Hala Bassaly, head of the Vector Biology surveillance and molecular group.

Lt. Cmdr. Sam Levin and Lt. T Joe Diclaro of NAMRU-3 met with Nigerian Navy Medical personnel. They visited with Commodore Jeremiah Onubi, the commanding officer of the Nigerian Naval Hospital. During this meeting, future collaborations in disease surveillance were discussed and a general overview of what NAMRU-3 does in the AOR were presented.

"It is normal for U.S. Navy personnel to visit with other Naval forces when the opportunity avails itself, as a matter of traditional naval camaraderie," said Levin.

Diclaro is working in collaboration with CITDR&P to establish communications with the Nigerian Army Preventive Medicine Department in hopes to expand vector surveillance conducted in Nigeria which may lead to a new collaboration with the Nigerian Navy and Army.

Mrs. Ireme Nassef (center) from NAMRU-3's Bacterial and Parasitic Disease Research Program conducted molecular training for Nigerian laboratory personnel at the Calabar Institute of Troical Diseaes Research and Prevention in the Cross River State of Nigeria as part of a capacity building effort.

Navy Medicine Researcher Participates in Pacific Partnership

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At the Naval Medical Research Center (NMRC) Hickey is a clinical investigator within the Malaria Department of the Infectious Diseases Directorate.

"I work primarily at the NMRC Clinical Trials Center and I have the privilege of being the Principal Investigator for an upcoming malaria vaccine study that will determine the protective efficacy and biomarkers of protection associated with irradiated sporozoites delivered by mosquito bites," said Hickey.

This clinical trial is supported by the Bill and Melinda Gates Foundation and DoD and promises to accelerate malaria vaccine development for our warfighters and the world.

Joint NAMRU-SA, Army ISR Project Recognized at the 2013 MHSRS Annual Conference

By Lt. Saima Raza

SAN ANTONIO, Texas—Dr. John Simecek, DDS, Director, Craniofacial Health and Restorative Medicine at the Naval Medical Research Unit San Antonio (NAMRU-SA), and his Army collaborators from the Dental and Trauma Research Detachment, Army Institute of Surgical Research (ISR), were recognized at the 2013 Military Health System Research Symposium (MHSRS) Annual Conference.

Their poster on *Incidents and Risk Factors on Dental Diseases and Non-Bartle Injury among U.S. Army Components in Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF)* took the Silver Award in the poster competition, out of 280 posters submitted.

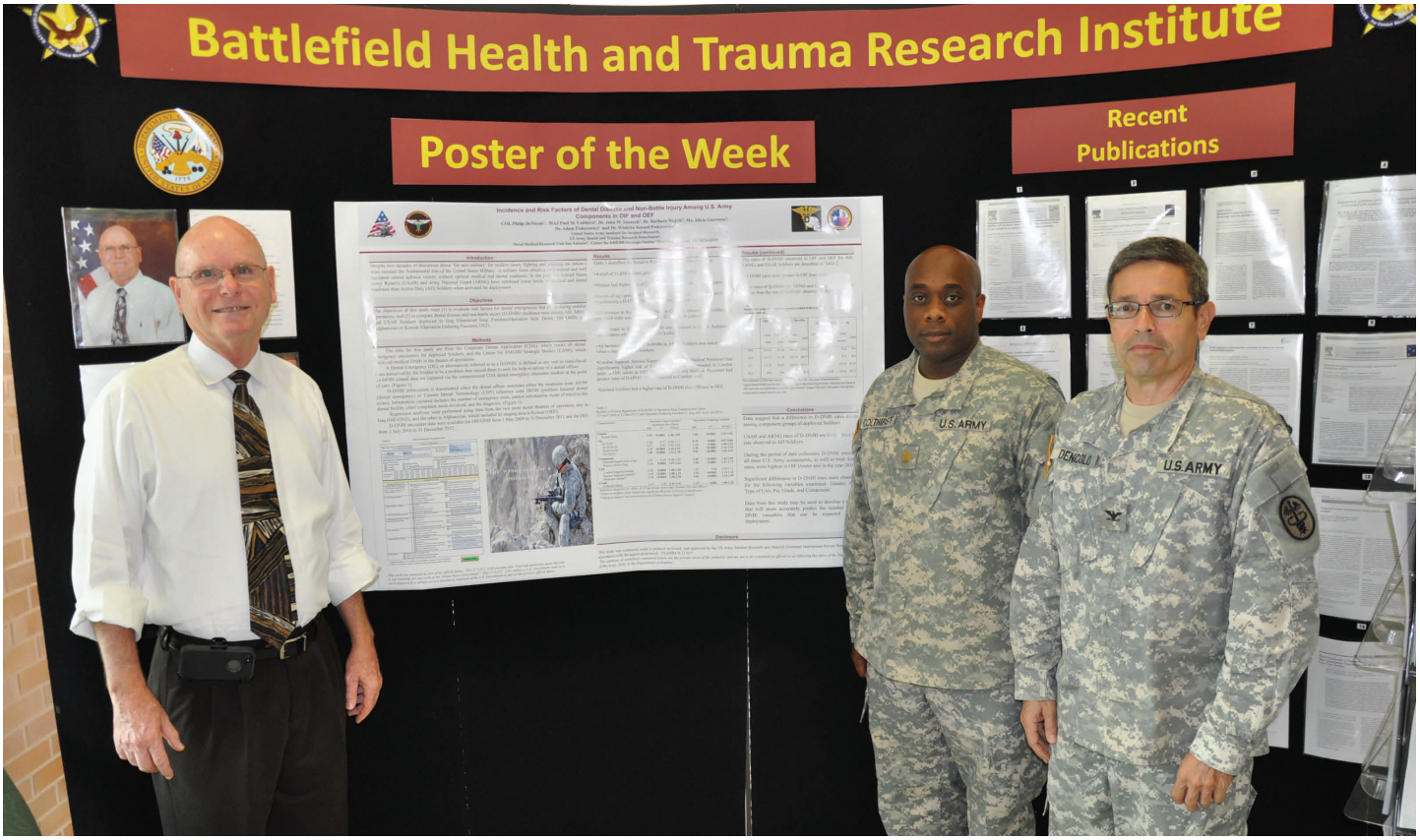
The poster highlighted the findings of a study on evaluating risk factors in dental emergencies not attributed to combat. The study found that approximately 15 percent of military personnel will experience a Dental Disease-Non-battle Injury (D-DNBI) during a one year deployment.

The D-DNBI data was available for OIF from May 2009 to December 2011, while OEF data covered the period of July 2010 to December 2012. A total of 31,659 entries were included in the study.

The study analyzed data entered using the Corporate Dental Application module, which will be deployed in the Navy dental care system in the near future. Data from the study may be used to develop a model that will more accurately predict the number of D-DNBI incidents that can be expected during a deployment.

Improving dental readiness could significantly increase individual medical readiness and enhance operational capabilities.

Future studies are planned to determine individual risk factors, develop new diagnostic methodologies, and develop D-DNBI predictive models which can be used to decrease D-DNBVI cases.



Dr. John Simecek, left; Maj. Paul Colthirst, center; and Col. Philip DeNicolo, right; display their winning poster at the Army Institute of Surgical Research entrance. The poster was recognized at the 2013 Military Health System Research Symposium Annual conference.

NMRC: Global Health Engagement

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upheaval following the Arab Spring. NAMRU-3 is currently serving three COCOM's and has 134 active collaboration projects in 22 countries in Africa, the Middle East, Eastern Europe and central Asia. NAMRU-3 is engaged in the regional response to the Middle East Respiratory Syndrome Coronavirus and serves as a reference center for deployed forces in the region as well as testing samples for CENTCOM. NAMRU-3 is also a WHO Collaborating Center for Influenza, Emerging Diseases, and HIV/AIDS and a WHO Reference Laboratory for Avian Influenza.

"NAMRU-3 is the regional leader in influenza surveillance based on its renowned virology laboratory services and close working relationship with the WHO Eastern Mediterranean Regional Office and the U.S. CDC," said Dr. Stephen Walz, NMRC, director of field laboratory operations.

In partnership with host national health agencies, the laboratory has established an influenza surveillance laboratory network throughout Africa, the Middle East, Eastern Europe, and central Asia and was the first to detect a human case of Avian Influenza in Egypt. With the host country, researchers established an integrated National Egyptian Disease Surveillance System for endemic and emerging disease in all 27 Egyptian governorates.

In addition, NAMRU-3 has been in the forefront in capacity building initiatives in AFRICOM and CENTCOM in collaboration with the ministries of health in the respective countries.

NAMRU-6, the only U.S. Navy command in South America, currently has over 120 active collaborative projects in nine counties in South and Central America.

"Researchers at NAMRU-6 played a major role in tracking the 2009 – 2010 swine influenza epidemic in Peru," added Walz.

NAMRU-6 researchers documented the introduction and spread of new dengue strains in northern Peru with surveillance efforts focused on dengue outbreaks and hemorrhagic fever cases. They also made the first association of spotted fever rickettsia with epidemic acute febrile illness in Peru and completed a cholera vaccine field efficacy trial with 26,000 volunteers.

"The team in Peru has also supported disaster relief efforts that include earthquake relief in southern Peru in 2007, urban yellow fever and dengue outbreaks in Paraguay, and a rabies outbreak in Madre de Dios, Peru," said Sanders.

NAMRU-2 is the laboratory that has moved the most since it was first established in Guam in 1945. From Guam the laboratory moved to Taipei in 1955, Manila in 1979, and Jakarta in 1990 where is remained until 2010. After an interim relocation to Pearl Harbor the command element moved to Singapore as NMRC-Asia in 2013 and manages regional field studies from the main lab in NAMRU-2 Phnom Penh in Cambodia. NMRC- Asia currently has 14 active collaborative projects in Singapore, Cambodia, Malaysia, Laos, and Vietnam with additional projects planned for those countries.

The researchers play a critical role in evaluating new anti-malarial drugs and conduct studies that determine the immune responses to malaria and dengue in order to support vaccine development. They also developed and deployed a computer-based early warning outbreak recognition system in Indonesia, Cambodia, Vietnam and Laos. These researchers developed and participated in a multilateral malaria meeting in Thailand this past June, focusing on military medical efforts in combating drug resistance and regional collaboration for elimination programs.

A key component to the work the OCONUS labs do is capacity-building projects with a host country's armed forces, Ministry of Health, and other institutions. Capacity building lays the groundwork for sustained research collaborations and partnerships. The NMRC research teams work closely with local scientists and researchers in their efforts to develop public health capacity that is compatible and sustainable with local resources allowing those scientists and researchers to actively contribute to the international global health community.

"It is a unique mission when we talk about capacity building or diseases surveillance, which is a critical function of public health. We don't take over the responsibilities of key public heath activities in a country. We have the laboratories in place and we can provide assistance in capacity building, provide technical expertise and resources when necessary, and we are assisting them in developing their public health infrastructure," said Sanders.

The CONUS laboratories support many of the OCONUS laboratory global health engagements. For example, researchers at the NMRC are developing vaccines against malaria, dengue and enterotoxigenic *Escherichia coli* in partnerships with multiple collaborators. These promising new vaccines have the potential to significantly impact operational health as well as global health. The most promising of these is a collaboration with other federal and industry partners that has resulted in a recent successful clinical trial of a new malaria vaccine. This was the first time that 100 percent protective efficacy was achieved in any clinical trial testing a candidate malaria vaccine.

The U.S. Navy is leading the way to a malaria vaccine for military personnel and for the millions of individuals suffering and dying from malaria worldwide. This includes the populations of over 100 countries spanning the tropical and subtropical regions of the world including most of Sahrana and sub-Saharan Africa, the Middle East, central Asia, South and Southeast Asia, Oceania, and South America and the Caribbean.

Navy Medicine has an officer assigned to the WHO in Geneva and another at the WHO European Regional Office in Copenhagen who ensure that the mission of Navy Medicine and the greater DoD global engagement in pandemic diseases control is coordinated with and responsive to the WHO regional and international health engagement initiatives.

NMRC Participates in Veteran ' s Day Event at Local High School

SILVER SPRING, Md. – Two staff members from the Naval Medical Research Center (NMRC) spoke to more than 1500 students at the John. F. Kennedy High School during the Navy Junior ROTC annual Veteran's Day Recognition Assemblies, Nov. 12. NMRC personnel were invited to share their personal background and military experience with the staff and students of the high school. Many students are not aware of what military life and service entails.

Lt. Cmdr. Nathaniel Smith, NMRC Director for Administration, and Dr. Kevin Porter, Head, NMRC Infectious Diseases Directorate (IDD) spoke about their background and military experience and what it means to serve in the U.S. Navy.

Smith addressed the students and said, "Your preparation coupled with opportunity will equal your success, particularly in the military."

Smith oversees seven departments ranging from administration to logistics. As the lead compliance officer for a multi-million dollar enterprise that encompasses eight research and development laboratories spanning the globe, he manages all operational and auxiliary support function programs. Smith is an expert Healthcare Administrator with a diverse military background, serving for 21 years in both Enlisted and Commissioned ranks.

Porter summed-up the benefits of military service by telling the students," I wanted my fate to be in my hands. That is where the Navy came in. They really came through for me and gave me opportunities to pursue my dream."

Porter served in the Medical Corps for 31 years before retiring to serve as Director of IDD. He oversees the research activities of four departments that include enteric diseases, malaria research, wound infections research, and viral and rickettsial diseases research. Porter is an expert in dengue virus research and is engaged in activities that are directed toward a multi-million dollar research effort to develop an effective dengue vaccine to protect military personnel deployed to areas of the world where dengue fever is endemic.

Dr. Kevin Porter, left, NMRC Director of Infectious Diseases, and Lt. Cmdr. Nathaniel Smith, NMRC Director of Administration (right) talk with NJROTC cadet Simone Epie-Ngome (center) after the John F. Kennedy High School NJROTC annual Veteran's Day Recognition Assemblies, Nov. 12. Epie-Ngome is a junior, a member of the color guard and the competitive rifle team and a JFK Varsity Tennis player and swimmer.

"When veterans such as Lt. Cmdr. Smith and Capt. Kevin Porter share their stories, the students learn from them and relate to them. Students begin to understand the meaning of citizenship and service that they cannot learn from a textbook or video," said Lt. Cmdr. Len. C. Greig, USCG (ret.), JROTC command officer.

For the last two years, NMRC military personnel have worked closely with Kennedy High School's Navy JROTC.

"This has been a mutually beneficial activity," said Lt. Rebecca Pavlicek, NMRC Wound Infections Department and volunteer instructor for the NJROTC program. "We have been able to help them with STEM education and other Navy related activities while they have given NMRC Lieutenants the chance to develop their leadership, mentorship and naval skills. I hope we continue to develop our ties with Kennedy's JRTOC program."

Check out NMRC ' s Recent Blogs on Navy Medicine Live:

Focusing the Power of NextGen Sequencing on Navy Medicine
A Scientist's Perspective on Research and Navy Medicine in San Antonio
Navy Medicine Researchers Work to Prevent Travelers' Diarrhea
Navy Medicine Continues Work on Malaria

Anchors Aweigh!! NMRC Tech Transfer Goes Full Steam Ahead

By Paul A. Coulis, Ph.D., NMRC Office of Technology Transfer

SILVER SPRING, Md. - The pace of the Naval Medical Research Center (NMRC) Office of Technology Transfer's (OTT) "search and deploy" mission to commercialize Navy biomedical technologies has significantly quickened with the recent addition of two professional staffers.

Since September, OTT completed marketability analyses of more than 45 Navy Medicine inventions for which patents were recently awarded or patent applications that have been submitted. More than ten inventions are being considered for licensing and eventual commercialization and more than ten companies have been contacted by OTT staff since October.

For example, a military supply company has expressed interest in commercializing a pneumatic tourniquet invention, which can be rapidly applied by an injured person, field medical personnel, or other warfighters. A push of a button inflates the device, and its air bladder serves to minimize tissue trauma by evenly distributing the constrictive pressure over the area of injury. In addition to being a lifesaver on the battlefield, the product could be marketed to civilian public safety agencies as well.

OTT has begun marketability analyses of more than forty other recently patented inventions developed by Navy Medicine scientists and their collaborators.

OTT utilizes several tools in conducting the analyses. In addition to conducting thorough interviews with the Navy Medicine inventors, there are discussions of the key intellectual property issues with colleagues in OTT's sister NMRC Office of Counsel. OTT staff use a sophisticated advanced-generation commercially available database containing information about potential partner companies currently developing complementary pharmaceuticals, biologicals, and medical devices. One license was recently executed aimed at the development of a malaria diagnostic.

In addition to marketing and licensing activities, OTT is responsible for the development of Cooperative Research and Development Agreements (CRADAs) between NMRC laboratories and non-government entities such as universities, biomedical companies, and research foundations. These instruments greatly leverage Navy capabilities with those of our partners, and can be a significant source of funding.

Since September, over twenty CRADAs have been executed. These CRADAs involve not only NMRC, but also the Naval Medical Research Unit – San Antonio, the Naval Submarine Medical Research Laboratory, and the U.S. Naval Medical Research Unit No. 6. These CRADAs have brought in over $1.7M in leveraged funding to support Navy Medicine's endeavor of bringing effective medical treatments to the warfighter.

Recently, a CRADA between NMRC's malaria department and a nonprofit organization was executed. The CRADA will provide NMRC with important funding to facilitate the improvement of the throughput capacity of NMRC's Inhibition of Liver Stage Development Assay (ILDSA). The assay tests antibodies specific for malarial parasites and lends itself to the identification of new antigens to be used for a malaria vaccine.

Office of Technology Transfer Welcomes Two New Members Aboard

After completing a tour of duty in the U.S. Navy aboard the guided missile frigate USS Harry E. Yarnell (DLG-17), Paul A. Coulis (left) received the Ph.D. degree in microbiology from the University of Chicago and conducted research in immunology and infectious diseases at the Naval Medical Research Institute. He later held research, technology transfer, marketing and business development positions in several biomedical companies. He retired from the NIH, where he served in program management, business development, and scientific review positions at the NIDA. Prior to joining NMRC he operated a private consulting business.

Ting Wang (right) was awarded the Ph. D. degree in neurobiology by the University of Pittsburgh and completed a Cancer Research Training Award post-doctoral fellowship at the NIH's National Cancer Institute. She is in the process of completing the Technology Transfer Certificate Program of the Foundation for Advanced Education in the Sciences, which is sponsored by the NIH.

New Defense Health Agency to streamline functions

by Defense Health Agency Public Affairs, Christmas Cantata

FALLS CHURCH, Va. (AFNS) - The government shutdown did not stop the official opening Oct. 1 of the Defense Health Agency (DHA), a major streamlining effort of military medicine that has been in the works for three decades and signed into law earlier this year.

"This day has been a long time in coming, and represents a major milestone in the history of the department and in military medicine," Dr. Jonathan Woodson, the assistant secretary of defense for health affairs, wrote in a message to staff.

Air Force Lt. Gen. Douglas Robb heads the new agency, which is to streamline health care among the Army, Navy and Air Force medical departments. The agency is charged with creating common business and clinical practices for the services and integrating functions that each has done separately, such as purchasing medical supplies and equipment.

In a message to staff, Robb acknowledged the budget challenges and government shutdown that coincided with the first day of operations for the DHA, saying, "How we deal with and overcome these challenges will be the true test of our character and our strength."

The military health system provides medical care on the battlefield as well as to service members, their families and military retirees at home. It is one of the largest health care systems in the world with 56 hospitals, hundreds of clinics and 160,000 employees. Some 2,500 babies are born each week into the system, which has an annual budget exceeding $50 billion.

Like in the civilian sector, military health care costs have increased faster than inflation. Military health costs have more than doubled in the past decade, increasing from $19 billion in fiscal 2001 to $51 billion in fiscal 2013. That now accounts for more than 10 percent of the department's budget. That figure is expected to grow, with the cost reaching $77 billion by 2022, according to officials with the Congressional Budget Office.

Integrating care and improving service Allen Middleton, the acting deputy director of DHA, said the agency reflects a recognition by everyone in the department for the need for military health care to be more integrated and efficient.

"We think there's a huge opportunity here for us to improve readiness, individual health and sustain quality, while also saving money," he said. "We do a lot of things in common across our system, and the agency is going to help us to bring various services together and deliver services in a more consistent way. We have had different organizations managing health IT; multiple organizations setting and overseeing pharmacy programs; and the list goes on."

To start, DHA is establishing a shared services model for managing and overseeing the operational work for health information technology, medical logistics, pharmacy operations and facilities planning for the services. In addition, the agency will manage the TRICARE health plan for the military's 9.6 million beneficiaries. TRICARE Management Activity's 800 workers are now part of DHA. Approximately 500 Army, Navy and Air Force staff, mostly IT professionals, have also moved to the new agency.

Defense health officials estimate the savings from these shared services will total at least $3.4 billion in the agency's first five years. They plan to submit their final report to Congress on implementation objectives, milestones and estimated cost savings later this month.

By Oct. 1, 2015, the agency is to be fully operational, and will also incorporate management and oversight of additional shared services, to include contracting, medical education and training, public health, resource management, and medical research and development. New shared services may be added over time, Middleton said.

Creating the DHA is just one of a list of things that Defense officials are doing to try to both improve the readiness of the force and slow the growth in military health costs.

"It will, hopefully, bend the curve a little bit," Middleton said.

While the reorganization is a big change for the overall MHS and the three service medical departments, officials believe that the near-term effect for beneficiaries will be minimal, and that -- over time -- it will be even easier for them to be seen at military treatment facilities, and more convenient to use online services.

"The Army still has its medical command. The Navy has its structure. And the Air Force still has its structure," Middleton said. "Those are unique missions that each of them has. And those unique mission requirements need to be preserved at all costs. All we've done is say, 'Let's bring some things together in a joint way.' This is as far as we've ever come in doing any of this."

Defense officials took another look at how to best organize military medicine several years ago. One big influence was seeing Army, Navy and Air Force medical personnel work more closely together in Iraq and Afghanistan.

"If you went to a contingency hospital overseas, you might have a Navy nurse anesthetist, an Army surgeon and an Air Force med tech all working on you," Middleton said. "Nobody knows the difference. Our medical fight in theater is a joint operation."

Then-Deputy Secretary of Defense William Lynn appointed a task force on military health system governance in 2011 to study how things might be reorganized. The task force reviewed different options and endorsed the creation of the agency.

Another of the task force's recommendations that the deputy secretary subsequently directed was to name market leaders to create a unified business plan for each of their respective six multi-service markets - geographic areas where more than one branch of the military operates medical facilities.

The new National Capital Region Multi-service Market is part of the DHA and replaces Joint Task Force National Capital Region Medical Command in Washington.

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NAMRU-SA Participates in 2013 Navy Ball, San Antonio

SAN ANTONIO, Texas - The city without an ocean or port hosted eleven major Navy Commands, Oct. 5, 2013. to celebrate the Navy's 238th Birthday celebration. Capt. Rita Simmons, commanding officer of the Naval Medical Research Unit – San Antonio (NAMRU-SA), had the privilege of delivering opening remarks for the 2013 Navy Ball held in San Antonio, Texas. More than 750 people, including service members from the Navy, Air Force, and Army, were in attendance.

In her remarks Simmons noted a number of distinguished guests as well as sailors who were there for their very first Navy Ball. She provided a brief overview of Naval history and described the yearly celebration as being a time to recognize the Navy's anniversary with "unique events and traditional observances".

The Ball's theme was "Securing the Seas and Beyond". Retired Adm. Patrick Walsh, who oversaw relief operations to the Japanese mainland after the 2011 earthquake, tsunami, and nuclear reactor accident, was the guest of honor and spoke to the direct relevance of the theme. He addressed the dedication and hard work of the service members involved in aiding and supporting those relief efforts. He also included personal messages from those who survived the catastrophic event.

Retired Capt. Norman Jack "Dusty" Kleiss, 97-years old, was recognized for his time serving during World War II as a dive bomber pilot who fought in numerous battles, including the 1942 Battle of Midway. His many decorations include the Distinguished Flying Cross and the Navy Cross. His impact on the crowd was clear as noted by the standing ovation given him.

The event included a friendly competition where Navy commands were challenged to decorate tables with centerpieces depicting their command's mission. NAMRU-SA came in 3rd for their centerpiece that represented the command's mission of supporting warfighters through conducting "medical, craniofacial, and directed energy biomedical research, which focuses on ways to enhance the health, safety, performance, and operational readiness of Navy and Marine Corps personnel". NAMRU-SA hosted a guest table where Navy Hospital Corpsmen and Air Force Tech students were able to talk about the command's mission and discuss the Navy's role in medical research and development.

Retired Capt. Norman Jack "Dusty" Kleiss, 97—years old, was recognized for his time serving during World War II at the Navy Ball in San Antonio, Texas, Oct. 5, 2013, in celebration of the Navy's 238th Birthday. He was a dive bomber pilot who fought in numerous battles.

Defense Health Agency

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These enhanced markets, as they are known, provide nearly half of all inpatient care delivered in military hospitals, encompass 40 percent of all TRICARE Prime beneficiaries enrolled to a military clinic, and serve as the primary medical training platforms for military medical staff.

These leaders, known as multiservice market managers, also have the authority to move medical personnel in a market in order to improve access to care, and keep their medical staffs fully utilized. The goal is to provide as much care as possible within military medical facilities and reduce care sent to the private sector - a step that both improves continuity of care and reduces costs.

The military treatment facilities are "where we really want to see the patients," Middleton said. "We think it's high-quality by all standards and it's important for clinicians to see many patients to maintain their skills."

The DHA will provide the managers of the multiservice markets with the data and analysis they need to make good medical and business decisions, Middleton said. "Everything we do is designed to enhance the readiness of the force -- the medical force, as well as the fighting force," he said.

NAMRU-SA Patient Active Warming Systems

(Continued from page 3)
ly evaluated a number of PAWS to establish the characteristics of each device.

They developed a testing model, which simulated a hypothermic body, to evaluate several performance measures. Information collected included: how much heat the units produced, how the heat was distributed, and the overall amount of heat transferred and maintained. Green man phantoms were used to test the systems due to their size, weight, and composition. The phantoms are filled with a mixture designed to simulate electrical and thermal properties of human tissue.

Each of the PAWS was tested in a controlled setting under conditions one would encounter in the operational environment including altitudes ranging from sea level to 10K ft., and temperatures ranging from ambient room air, at 25°C, and down to 18°C. Performance characteristics of both electrical and chemical systems were evaluated.

NAMRU-SA scientists will be providing a report to the Marine Corps to include advantages and disadvantages of each PAWS device. Results will aid the Marine Corps in selecting the most efficient device to deploy to the relevant are of operation and to ensure each system can operate safely and effectively to prevent or treat hypothermia.

Greetings from the NMRC Ombudsman!

Happy Veterans Day!

The days are getting shorter and the weather is getting colder, each a sign of winter's approach. However, winter's approach hasn't been the only change on my mind of late. My husband and I are in the midst of a transition too, with an impending move to a new duty station in December. With our departure from the Naval Medical Research Center, I will be resigning from my role as the command ombudsman. Therefore, this will be my final article for the command newsletter. However, before I leave, I would like to take a moment to thank the command for their support of the Ombudsman role and say how much I've enjoyed getting to know you, my NMRC family.

Additionally, although I will not longer be your Ombudsman, I want to ensure that you continue to have access to any support and resources you may need. With this in mind, I provided below a few of the resources that I've highlighted in the past. Always know that assistance is always just a phone call away!

For local assistance, you can contact:

The Navy-Marine Corps Relief Society at (301) 295-1207 or Bethesda@nmcrs.org. Alternatively, you can visit their office at the Walter Reed National Military Medical Center (Hours: Mon-Fri 0830-1600), located at 8901 Wisconsin Ave. Bethesda, MD 20889 -5600.

The Fleet and Family Readiness Office offers counseling to assist in you in maneuvering life's challenges. You may call them at (301) 319-4087/4088 or visit them at the Walter Reed National Military Medical Center located in Building 11 Room 148B. Their hours are Mon-Fri 0730-1600.

Other resources include:

Military OneSource at www.militaryonesource.mil/ or by phone at (800) 342-9647

Suicide Prevention Hotline (800) 273-TALK (8255)

DoD Safe Helpline for Sexual Assault Support (877) 995-5247

The National Coalition Against Domestic Violence website at http://www.ncadv.org/.

Thank you again for allowing me to serve you over these many months!

Have a Fine Navy Day!

Alexandra Mora